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ABSTRACT

This report summarizes the findings of an impact study of the National Science Foundation (NSF) program of Presidential Awards for Excellence in Science and Mathematics Teaching (PAESMT). In 1994, NSF commissioned a company to conduct a series of informal conversations with 115 of the 430 awardees to gather more systematic information on what it means to be recognized as an awardee and how receiving the award has affected the teachers' lives and careers. Topics covered included: impact of the recognition of the awardees; their use of financial rewards and gifts; their reflections on the nomination, selection, and award process; and their suggestions for strengthening the program and broadening its coverage. Findings showed that PAESMT is seen as an overwhelming success in terms of its impact on participants and the recognition of the importance of good mathematics and science instruction. Strong positive effects were found on the personal level, the professional level, and the public level for those who had been recognized. Many rewardees look for ways to share the monetary award with their colleagues, providing support for conferences or other training activities. (MKR)

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Short-Term Impact Study of the Presidential Awards for Excellence in Science and Mathematics Teaching

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SHORT-TERM IMPACT STUDY OF THE PRESIDENTIAL AWARDS FOR EXCELLENCE IN SCIENCE AND MATHEMATICS TEACHING

Prepared under Contract
#SED 92-55369

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Short-Term Impact Study of the Presidential Awards for Excellence in Science and Mathematics Teaching

PREFACE

This report summarizes the findings of an impact study of the National Science Foundation's Presidential Awards for Excellence in Science and Mathematics Teaching program. The program provides recognition to outstanding mathematics and science teachers in all 50 states and territories.

Although the program has been in place for over a decade and is considered to be extremely valuable, little information has been gathered about its impact on those who are recognized. In 1994, NSF asked Westat to carry out a series of informal conversations with a small number of awardees to gather more systematic information on what it means to be recognized as an awardee and how receiving the award has affected the teachers' lives and careers. This report presents the results of these conversations.

This report is based upon work supported by the National Science Foundation under NSF contract no. SED 92-55369. Any opinions, conclusions, or recommendations expressed in this report are those of the authors and do not necessarily reflect the views of the National Science Foundation.

Short-Term Impact Study of the Presidential Awards for Excellence in Science and Mathematics Teaching

EXECUTIVE SUMMARY

The Presidential Awards for Excellence in Science and Mathematics Teaching program (PAESMT) was begun in 1983 to recognize outstanding science and mathematics teachers in all 50 states and the territories. Since that time, over 1,600 teachers have received national recognition for their subject matter competence and teaching skills. Although PAESMT is a well recognized and respected program, no formal evaluation of its impact on participants has ever been conducted. The purpose of this study is to examine program impact as perceived by the awardees themselves.

Conversations were held with 115 of the 430 teachers who received awards in 1990 and 1991. Topics covered included

- the impacts of the recognition on the awardees,
- their use of financial rewards and gifts,
- their reflections on the nomination, selection, and award process, and
- their suggestions for strengthening the program and broadening its coverage.

Our findings show that PAESMT is seen as an overwhelming success in terms of its impact on participants and the recognition it provides to the importance of good mathematics and science instruction. Strong positive effects are found on the personal level, the professional level, and the public level for those who have been recognized. Awardees report increased respect for teachers and the teaching profession and a renewed sense of validation for their efforts and motivation to continue as teachers. Few awardees leave teaching; many take on increased duties and responsibilities.

The monetary reward ($7,500) associated with the award is used in a wide variety of ways, with most recipients spreading the funds among a number of different uses, and many seeking opportunities to combine them with other resources to make a larger and more long-lasting impact. Many teachers look for ways to share the reward with their colleagues, providing support for conferences or other training activities. Ninety percent see the financial award as an important part of the recognition.

While many of the awardees have received considerable personal recognition and publicity as a result of the award, awareness of the award itself and the nomination process was described as less broad based and in need of improvement. Some felt that only those actively involved in professional teacher organizations were sufficiently familiar with it. Other suggestions, besides increased publicity for bringing a wider representation of the teaching force into the recognition circle, centered on possible revisions to the application process itself. The application process was described as being "burdensome" and discouraging to some very worthy candidates.

Taken as a whole, the findings indicate that PAESMT is a program of significant merit and that its positive impacts reach far beyond the 1,400 teachers who have been individually recognized.

BACKGROUND

The Presidential Awards for Excellence in Science and Mathematics Teaching program (PAESMT) was begun in 1983 to recognize secondary-level mathematics and science teachers. Over the last decade, the program has expanded to include elementary as well as secondary teachers in all 50 states and the territories. Over 1,600 teachers have received national recognition. In addition, individual states have provided celebrations to recognize the talents of hundreds of teachers.

Criteria for selection include subject matter competence and evidence of sustained professional development, an understanding of how children learn mathematics and science, an ability to engage students in direct, hands-on learning activities, and an ability to foster curiosity and generate excitement among students. Awardees are expected to provide examples of their innovative approaches to teaching, as well as their leadership abilities (description taken from *PROFILES: A Closer Look*, NSF, in press).

Although PAESMT is a well recognized and respected program, no formal evaluation of it has ever been conducted. In an effort to gain knowledge that will enhance and improve the program, the National Science Foundation (NSF) has requested a study of the program's impact as seen through the eyes of recent awardees. The purpose of the impact study is to gather data from a small sample of awardees that will be used to examine both the strengths and weaknesses of the program and to determine the effects on a teacher selected for this program.

METHODOLOGY

The sample for this impact study was drawn from 430 awardees recognized in 1990 and 1991. We selected this group because

- Teachers from all grade levels (elementary and secondary teachers) were included (elementary teachers were added to the program in 1990);
- All awardees received a $7,500 award to use for educational purposes (this amount was established in 1989);
- The relative recency of the award would result in comments on the strengths and weaknesses of the program that are current; and
- Sufficient time has passed to allow the development of a meaningful picture of the impact of being named an awardee.

A sample of 126 awardees was drawn using the following rules:

- Awardees were sorted by state.
- Awardees from Puerto Rico, the Department of Defense schools, and the U.S. territories were excluded.
- All minorities were selected with a probability of "1." (These awardees--25 in total--were heavily concentrated in two locations, the District of Columbia, 6, and Hawaii, 5.)
- The remaining 101 members of the sample were selected within states, balancing out subject matter and grade level.

Telephone interviews were completed with 115 awardees, 91.3 percent of those sampled. The remaining 11 were not interviewed because of problems in scheduling or locating the awardee or because he or she had died. None of the awardees contacted declined to be interviewed.

The exhibit that follows presents the characteristics of the respondent sample.

The respondent sample (1990 and 1991 awardees)

	Elementary (N=58)	Secondary (N=57)
American Indian	1	0
Asian	7	2
African American	5	4
Hispanic	0	2
White	45	49
Male	3	17
Female	55	40
Mathematics	28	27
Science	30	30

A telephone interview protocol was developed to guide the conversations. Although the exact questions varied from respondent to respondent, the menu of topics covered included the following:

- the impacts of the recognition on the awardees,
- their use of financial awards and gifts,
- their reflections on the nomination, selection, and award process, and
- their suggestions for strengthening the program and broadening its coverage.

Overview of Findings

Our conversations with the sample of awardees from the 1990 and 1991 program years indicate that the Presidential Awards for Excellence in Science and Mathematics Teaching program is clearly seen as a success in the eyes of the many elementary and secondary teachers who have been recognized. Impacts are found on the personal, professional, and public levels. The program appears to be tremendously effective, not only in terms of its impact on individuals, but also for the recognition it provides for the many success stories in the field of teaching. Further, the benefits of the program are shared by many colleagues and students with whom the awardees interact.

The pages that follow present what we learned from our conversations with the 115 awardees, frequently in their own words. And, while there are some problems that were revealed and some rough edges that need smoothing, it is evident that PAESMT is a program of significant merit.

Impacts of the Recognition

The awardees' widespread view of the PAESMT was extremely positive. Many expressed the thrill of winning the award, the benefit of the recognition, and the changes that the financial award allowed them to make. Many felt that the award gave them renewed interest in continuing a teaching career. And, fortunately, most of the outstanding teachers have chosen to remain in the classroom. The sentiment heard over and over again was that of "validation." The award validated their own personal belief in the importance of teaching and their confidence in their ability to make a difference. As one awardee put it,

> *It was an incredible experience. I am still floating. It expanded me professionally and gave me the freedom to do what I want to do.*

Others discussed the statement the award makes about the teaching profession. One awardee commented,

> *It is a big award and a great honor. It's difficult for teachers to be recognized and this award says that what you do is important.*

Another said,

> *It stresses that excellence in education is recognized and encouraged.*

Other awardees emphasized what the award allowed them to do for other people. Because of the award, noted one recipient, he will affect many students with the upgrading of education accomplished through his leadership efforts. As he put it,

> *the students are the real recipients of the award.*

The awardees also reported that the award affected the attitudes of their students and their students' parents, enhanced interest and respect for excellence in teaching among local school personnel, affected opportunities for awardees to make changes, and led to increased opportunities for networking with other teachers.

Unfortunately, not all of the effects of the award were positive. Some teachers experienced jealousy from their fellow teachers and from administrators. In some cases the jealousy served as a positive motivating factor and created a beneficial competition, while in other cases it created a negative atmosphere for the awardee.

Both the positive and negative effects of the award are discussed in more detail below. Where possible, percentages are provided to summarize results. In other cases, the range of activities engaged in by awardees are described as examples of activities rather than as percentages.

Percentage of classroom teachers intending to remain in teaching (1990 and 1991 awardees) (N=113)

Changes in Job Duties

By and large, the teachers recognized by the program have remained teachers and continue to provide high quality educational experiences for their students.

The majority of teachers (73 percent) did not experience significant changes in their job duties or responsibilities following the award, although over a third (37 percent) mentioned an increase in the amount of respect that they were given at their job. Some awardees said that the increased respect and credibility came from other school personnel, while others described increased respect from parents. Many indicated that others trusted their judgment more and that they were now asked to contribute whenever important decisions were made. Some also mentioned that the award enhanced respect for the school within the community.

Of those 27 percent of respondents who experienced changes in their job duties, these changes were largely in the direction of a higher level of responsibility than they had prior to the award. (It should be noted that some teachers did not experience significant changes in job responsibilities because they already had a high level of responsibility at the time of the award.) For those who did experience significant changes, new responsibilities included becoming the chair of the department or the coordinator of curriculum, starting new programs, being on committees, and training other teachers. Other respondents changed schools or began teaching at the university level.

Few of the respondents intended to leave teaching. Only 12 of the 113 respondents (11 percent) who had been classroom teachers at the time of their award did not intend to remain so. Of these, 2 were no longer teaching because they had retired. The others who reported that they were no longer involved in teaching (or intended to leave teaching shortly) remained in the field of education in roles such as training other teachers or working at the state level.

Almost half of the awardees (49 percent) who were still teaching at the time of the interview

said that the award had increased their enthusiasm for teaching. Most of those who said their enthusiasm had not increased indicated that they had always loved teaching and their enthusiasm was always high. Of those who noted a change in their enthusiasm, many mentioned that the PAESMT award renewed them and made them believe that what they were doing was important. For example, respondents said that the award was "a real shot in the arm," a "boost," and that it gave them "renewed spirit." The following comments illustrate awardees' responses.

[The award] validated that I had something to offer and gave me a greater sense of what I can give back to others.

> *[The award] energized me and enhanced my commitment to science education.*
>
> *[The award] gave me new techniques and the confidence to try them.*
>
> *[The award] validated that I had something to offer and gave me a greater sense of what I can give back to others.*

Others mentioned the need for increased enthusiasm in the midst of troubled times for schools. One awardee said the award came at a low point in her career because of the poor status of her school system. The PAESMT award was very uplifting for her morale. Another respondent, who had taught for 18 years prior to the award, said that the award had come at a time when education was at a low point. There had been many cutbacks, but

> *the award gave me a tremendous feeling of validation. It was what I needed.*

Aspect of the Program with the Largest Impact

When asked about what aspect of the program had the biggest effect, 62 percent of respondents said that it was the recognition. Other aspects mentioned frequently by respondents were the financial award and the networking both in Washington and through the association for awardees. One respondent also mentioned the beneficial effect of the IBM computer that was given as part of the PAESMT package.

Effect of Award on Parents and Students

When asked whether the award had affected the attitudes of the respondents' students and their parents, 96 percent said that it had. Of those who said that it had not, many of them mentioned either that they had always had high credibility with parents and students or that expectations for teaching excellence were so high at their school that the award was to be expected.

Only one respondent said that the parents and students did not know about the award. In this case, there had been many previous PAESMT winners in the district. Because it was not a new occurrence, there was not widespread publicity about the award.

Most respondents reported that parents and students were proud and congratulatory, and some mentioned the pride brought to the school and community. One teacher said that her school had a pep rally for her and that the mayor named the day in her honor. Another said that the award brought positive recognition to a school and teachers that were

> *[otherwise] perceived very poorly by parents, by the administration, and by the media.*

Teachers in this community had been "embarrassed" to say in public what they did. In her community, the PAESMT award was a real uplift, " a local phenomenon."

Many of the respondents reported that the award reinforced for parents and students that the awardee was a good teacher. As one awardee said,

> *PAESMT gave the parents confidence in me.*

Another teacher said that the award made parents more attentive at workshops and resulted in the parents supporting her more. Another teacher noted a change in parents' perceptions of the meaning of an education. In her community, education had been perceived only as a means to an end for a job.

> *To make math a fun science was the farthest thing from their minds.*

But through her differing approaches to teaching and the validation of the award, parents' views of education changed.

Despite almost all positive effects on parents and students, two teachers mentioned negative effects. One noted that although it was nice to be recognized and to have parents want to have their children in his class, not all children could be in the same class and this caused some problems for those left out. Also, parents' requests are sometimes difficult for the teachers who are not requested. Another teacher mentioned that because he was frequently out of the classroom due to his increased opportunities, parents and students complained.

Effect of Award on Enhancing Interest and Respect for Excellence in Teaching

Almost all teachers (90 percent) indicated that the award had enhanced interest and respect for teaching among other local school personnel. Some teachers reported that other teachers now come to them for advice. Other awardees have been asked to do inservice training of fellow teachers. Others mentioned that their award has encouraged other teachers to try to get PAESMT awards.

Although the award had many positive effects, 15 percent of respondents indicated that there was some jealousy about their award. And, respondents indicated how disappointed they were to experience animosity from those whom they thought were their friends. One believed the jealousy at the school stemmed from limited resources. Another believed that the school did not publicize the award for fear of jealousy. Still another noted that he had to handle the financial award in a way designed to avoid jealousy. He tried to spend it on the school building and not just on his classroom and himself. He also sent a picture of the school to President Bush in order to make the school feel ownership of the honor.

Effect of Award on Influence at the Local School or District

Despite some negative effects of the award among school personnel, a majority of teachers (86 percent) said that the award increased their opportunities to make changes or have influence over how math or science was taught at the local school or district. Thirty-one percent of these respondents said that following the award their opinions carried more weight in how math or science was taught. Many awardees became involved in curriculum development, while others taught inservice workshops for other teachers or mentored teachers in other ways.

Effect of Award on Opportunities Beyond the Local School or District

A majority of teachers (83 percent) reported that the award affected their opportunities for leadership or influence at the state level. Opportunities at the state level varied widely. Twenty-six percent of those involved at the state level reviewed nominations for the next PAESMT awardees, and 19 percent were involved in developing Statewide Systemic Initiative (SSI) programs. Other such involvement included working on committees for student awards, developing curriculum, consulting with other districts, providing leadership in state board testing performance evaluation, sitting on review panels for grants of higher education, teaching workshops at universities, teaching a course for NSF, working on state competencies, speaking to the state legislature, and setting state standards.

Percentage of sample reporting that the award enhanced interest and respect for teaching among other local school personnel (1990 and 1991 awardees)

(N=107)

Over a fifth (23 percent) of teachers indicated that the award affected their involvement at the federal level. Of these, 52 percent were involved in NSF grant review panels. Other types of involvement varied greatly. These included being involved in NSF teacher enhancement, being part of an NSF reading panel, addressing PAESMT awardees, and participating in proposal reviews for the U.S. Department of Education. One teacher was also an advocate to the Science and Space Committees in Congress for appropriations for aircraft to carry an infrared telescope. She was one of the first elementary school teachers to fly in the KUIPER C141, which carries as its cargo for NASA a 2-meter telescope that does infrared exploration of the universe.

The award affected other types of opportunities for respondents as well. Almost three-fourths of respondents (74 percent) believed that the award had affected their opportunities in teacher associations. Activities in this area included giving talks at association meetings, being part of planning conference activities, being on the editorial board of the National Council for Teachers of Mathematics (NCTM) arithmetic panel, being involved in the NCTM National Goals Panel, and being on a National Science Teachers Association (NSTA) committee task force.

Sixty-four percent of respondents indicated opportunities in the public media. (However, it should be noted that some respondents counted publicity about the award itself in answering this question, while others did not. Thus, this percentage may be inflated.) Much of the public media opportunities mentioned by teachers appeared to concern publicity about the award itself. Few teachers had other opportunities in the public media, with some exceptions. For example, one teacher had a regular radio program and another made a videotape of her teaching for an educational television station. Others had contributed to a PBS television series, and one teacher had a regular television program during the school year. Although the question was not specifically asked, about 9 percent of the respondents volunteered that they were involved in publishing. Activities in this area included authoring books, textbooks, and journal articles.

Over half (57 percent) of the teachers were offered opportunities in the private sector. Again, these activities varied widely. They include teaching at universities, being on an advisory board for a museum, working with PBS on a math program, and working with businesses in the community.

Over a third of teachers (37 percent) believed the award affected their opportunities to further their own education. Some have pursued administration and supervision certificates, master's degrees, and Ph.D.'s, while others have taken more credit hours in a subject, attended special institutes, or received training in specific areas of interest, such as meteorology and family math. One teacher said that the award gave her motivation to go back to school. Before the award, she had never thought of getting a higher level of education.

It made an entire school that was not "into" science become interested and understand the significance of what was going on in science.

Most teachers (85 percent) indicated that the effects of these awards were long lasting, even though many of their opportunities arose right after the award. A few teachers had received several other awards, and the PAESMT award in combination with these had a "snowball effect."

Effect of Award on Opportunities for Networking

A vast majority of teachers (90 percent) indicated that the award affected their networking with other teachers, including fellow awardees, and getting to know other teachers at conventions and meetings. Networking has been helpful to teachers in sharing ideas, keeping current on the latest issues in their field, getting teaching ideas, and gaining support for teaching. Many teachers network with other awardees. As one teacher said,

When I need a resource person, I pull out my PAESMT directory.

Percentage of awardees reporting positive effects on opportunities for leadership at various levels (N=115)

Federal level	23%
State level	83%
Teacher associations	74%
Public media	64%
Private sector	57%

Although many respondents noted that the networking was the biggest "plus" of the award, others were disappointed in the networking, especially at the national level. Some said they had not networked as much as they had hoped because they did not have enough time or it was not something that came to them easily. Others said that they could not afford to go to conventions, and still others said they wish that continuing meetings with other awardees was a mandatory part of the PAESMT program so that they would be sure to maintain their contacts. Of note was that many teachers reported not being able to use their computers to network with other teachers. Many mentioned the need for more training in this area.

Comparison Between Whites and Minorities of Opportunities Resulting from Award

There were few differences in opportunities between whites and members of minority groups in opportunities that were the result of the award. For example, there were only slight differences in the percentages of minorities and whites who reported increased opportunities at the state level. Eighty-six percent of minority members and 83 percent of whites reported increased opportunities. There were also only small differences in opportunities to participate in teacher associations (71 percent minorities versus 74 percent whites) or networking opportunities (86 percent of minorities and 91 percent of whites).

However, minorities reported more opportunities than whites in involvement at the federal level (33 percent minorities versus 22 percent whites) and in the private sector (76 percent minorities versus 53 percent whites). Whites, however, reported more opportunities than minorities in making changes or influencing how math/science is taught at the school or

district level (96 percent whites versus 70 percent minorities) and in opportunities for continuing their education (38 percent whites versus 29 percent minorities).

Impact of Financial Award and Gifts

This section provides information on how the awardees used the monies that they were given. As the responses illustrate, their choices were innovative, creative, and in many, many cases, unselfish. Virtually all respondents said that the financial award was important and made an impact on what they were doing. Some typical comments follow.

> *I had the ability to buy something that never would have been possible with the limited school budget.*
>
> *By helping each teacher, I helped each child and everyone was touched by the grant. It was an award for all.*
>
> *It gave me a little bit of a voice.*
>
> *Once the principal saw how the computer was used in the classroom, the principal got an additional nine computers the next year.*
>
> *It gave me the freedom to explore other options that are not tied to the local bureaucratic system. It made an entire school that was not "into" science become interested and understand the significance of what was going on in science.*

Use of Award Money

Respondents were asked for some specific details about how they had spent their $7,500 award. The vast majority had spent the money on more than one item, sometimes using it as seed money, sometimes combining it in innovative ways with other sources of funds. Only 9 of the 115 respondents (8 percent) reported that they used all the money on one item.

At least 59 percent of the respondents spent all or part of the money on other teachers in their school or district. A few commented that sharing the award with other teachers had been suggested during the week in Washington. Of the 69 respondents who had used part of the money for other teachers, 46 percent used it for attendance at conferences or meetings, 36 percent for materials, and 39 percent for training or workshops. (Some respondents sponsored more than one activity.) Among the comments made by respondents were these.

> *I tried to spread the money among other teachers and get them involved.*
>
> *I tried to give other teachers more opportunities.*
>
> *I was very open to teacher requests.*
>
> *I looked for things that would inspire.*

Three teachers spent all $7,500 on the training of other teachers. One of them got matching funds from the district and funded a 10-day training program on new strategies for teaching mathematics for elementary and secondary teachers.

One awardee sent a fifth grade teacher who hated math to the NCTM convention in Seattle. This "turned her on to math." As the awardee said,

> *I lighted another fire.*

Another awardee provided the funds for an aide to attend a national science convention; she said a district would never fund an aide to do this. The experience motivated the aide, who now has a degree.

At least three math teachers provided materials for the science teachers. One math teacher established a three-tiered approach for spending the money: 1) for teachers, materials for math and science; 2) for students, scholarships for a summer program for at-risk students; and 3) for parents, information packets as part of a parent program. One awardee formed a group of staff, parents, and community members to identify how to spend the money.

Computers were purchased by about one-third of the respondents (31 percent). Other kinds of equipment, such as graphing calculators, laser disk players, microscopes, and printers, were mentioned by 58 percent. Manipulatives and materials for hands-on instruction were mentioned by 17 percent. About one-third (31 percent) had used part of the money to attend a professional conference or meeting; these expenses included travel and lodging as well as the cost of a substitute teacher.

Other ways in which the individual respondents spent the money varied considerably. A listing of some of the innovative uses of funds is presented on the following page.

Sometimes the awardees mentioned certain barriers that impeded their use of funds, but such occurrences were relatively rare and idiosyncratic. Of the respondents who were asked about barriers in spending the money, 82 percent said there were none. In a few cases, there was disagreement regarding how the money would be spent. In three instances where such conflicts arose, NSF was called in to help resolve the problem. Some of the problems that arose are as follows:

- In two cases, the school had a new principal who wanted to spend the money on such things as renovations, replacement equipment, and a rug for the office.
- In another case the administration wanted to purchase materials that the respondent did not think the other teachers were ready to use. As a result of the disagreement, one administrator still does not speak to her.
- Three other respondents had trouble with the type of account they wanted to set up. For example, one district insisted that the money be put in the general fund and could not be in an interest-bearing account. After a letter was sent from NSF, the money was put in a separate account, but it does not earn interest.
- One awardee ran into problems when she switched districts.
- The other respondents experiencing barriers made more general comments about the red tape involved.

Awardees comments regarding the financial award (N=115)

Important	90%
Essential	44%
Meaningful and motivational	23%
Needed for an impact	23%

Importance of the Financial Award

The financial award is an important part of the program, according to 90 percent of the respondents. For 44 percent of them, it is an *essential* part of the award. In fact, for four respondents, the only reason they applied to the program was because of the possibility of receiving money for their students. Several commented that the money gives credibility to the program. Others said that it was essential in schools that have few resources. An

Environmental

- *Improvements to a model stream fish hatchery*
- *Surveying a nature trail behind the school*
- *Conversion of a room to a greenhouse*
- *Purchase and construction of a log cabin to serve as the science classroom; around the cabin is an outdoor learning center with herb and vegetable gardens*
- *Two-day ecology summer camp for students*

Telecommunication

- *Establishment of a statewide telecommunications center*
- *Telecommunications center for tracking storms*
- *Establishment of a direct satellite receiver station*
- *Weather satellite imaging project*
- *Computer center for distance learning in a district with students in small rural schools that are 150 miles away; the students can continue to live at home and take courses in physics and chemistry*

Innovative Uses of Award Funds
(1990 and 1991 awardees)

Other

- *Foreign travel with a scientific emphasis -- one teacher went to the Peruvian Amazon and the other to East Africa to study biodiversity*
- *Organization of an alliance of physics teachers under the American Physical Society*
- *Special little projects, each costing a few hundred dollars, that the awardee would ordinarily hesitate to do. For example, the teacher has a contest for the students in which they must mail a potato chip to him. They must design the package to weigh as little as possible, and the potato chip must arrive intact. The postage and materials cost about $100 per year.*
- *Conference for young girls to expand their horizons in math; minority students were encouraged to attend*
- *Mobile science shows that travel throughout the rural area of the state*

additional 23 percent said that it was important, meaningful, and motivational. In addition, 23 percent said that the money was needed in order to have an impact. Comments from the awardees were,

> *It enables the school to share in the recognition.*
>
> *The effect of the money is to the school and the district.*
>
> *You come back from Washington with a mission; for some things you need money.*

One awardee commented,

> *I'd like to say, "No," that it's not essential, but money makes the district and people around sit up and notice.*

The few respondents who said that the money was not a necessary part of the program still thought it was wonderful to have. Many respondents said that the money gave them the freedom to do what they wanted. It was a mechanism for empowering teachers. Some illustrative comments by respondents follow.

> *It enabled me to do special things I couldn't do otherwise. It gave a cushion to act in a professional way.*
>
> *There are so many reforms going on. You can't do a lot without resources. Many teachers buy things with their own money.*
>
> *In our society, money talks.*
>
> *I have taught a science program on a budget of $142 for the entire year. So you can imagine what this infusion of $7,500 means to us.*
>
> *It mentally empowered me. I have money that I can spend and don't have to ask for. It's power you don't have in teaching.*

For 57 percent of the respondents, the award would not be less meaningful without the financial component. They said that the recognition was far more important and that being acknowledged is sufficient. A few added that for the individual teacher, it is the honor that is important. For the 43 percent of the respondents who disagreed, the money was seen as adding meaning and prestige.

Most respondents thought that the amount of the financial award was sufficient to make an impact. Over four-fifths (84 percent) thought the amount was sufficient, although, not surprisingly, many of these added that more would be better.

Additional Donations or Gifts

Many of the respondents had received a number of small gifts after winning the award. It was often unclear if these were gifts for all awardees that year or just for the individual. One awardee commented that she wrote 74 thank you notes. The kinds of awards received by the respondents include $1,000 from a consortium of electric companies and $1,500 from a gasoline company. In addition, many of the PAESMT awardees have won other awards as well, many of which come with money and/or gifts. One respondent suggested, "Other programs use the Presidential Award list as a guide for selection."

Some respondents were able to use the award to leverage additional funds.

> *It got me to start writing grants for more money.*

The pot is large enough to get business to match. The Presidential Award gave a foot in the door.

It's a high profile award and receives much media attention. This makes it easier to get local grants.

I have taught a science program on a budget of $142 for the entire year. So you can imagine what this infusion of $7,500 means to us.

The pot is large enough to get business to match. The Presidential Award gave a foot in the door.

The awardee who made the last comment also received $1,000 from the local utility company to spend however she wanted. She received additional money from the National Tandy Technology Scholar award. The award also made it easier for her to apply to a local philanthropic organization.

However, some awardees tried unsuccessfully to obtain additional money. One said that the superintendent was not comfortable with teachers making contacts with businesses.

Examples of how awardees used the additional funds follow.

One awardee received a Chevrolet van from 29 dealers in the state. She used it for her mobile science show, which was taken throughout the state. This awardee also established a summer training program for teachers in the state and received $750,000 to support this effort.

One respondent now teaches in the same building as the previous year's awardee. They pooled some of their award money to establish a statewide telecommunications line. The system has been used to do environmental monitoring. Both of the awardees also received Christa MacAuliff awards of $30,000 each. They have used this money for the network. The respondent also received $35,000 from the Tapestry awards sponsored by Toyota. In addition, he has gotten grants through local banks. He commented, "Once a project gets going and has a track record, it is more likely to be funded. The initial seed money is the hard part."

"NSF encourages getting funding from other sources, an extremely worthwhile idea," was a statement made by another awardee. The materials for a weather imaging project cost $5,000. In addition to PAESMT money, the awardee used money from an effective schools grant, from the State Office of Basic Industry, and from a school fundraiser (a carnival). In addition, she received a GTE gift grant to integrate physics and algebra; $7,000 was shared between math and science.

Nomination, Selection, and Award Process

Another area we explored in the conversations with awardees was the nomination, selection, and award process. We were especially interested in finding out how the process differed by states. Respondents' comments indicated somewhat of a lack of knowledge in this area, particularly where the awardee had not been called upon to play a role in the selection of others. We were not, therefore, able to develop a very good picture of the differences that do exist and what might affect them.

Program Administration

Familiarity about the administration of the program varied considerably across respondents. Some simply did not know how the program was administered. Others were more aware because they had served on a committee to select the winners.

The general picture across states is quite similar. Nominations are sent to the state department of education or state board of education, which then sends an application packet to the nominees. The nominees complete the materials and submit them to the state office. A selection committee, generally composed of representatives from several arenas, including past awardees, picks the three state finalists for each category. The names of the finalists are submitted to NSF, which makes the final selection.

Some respondents thought that the state science and math teachers' organizations were involved in the process, or actually ran it. However, responses from teachers in the same state differed, so a complete picture was not obtained.

In one state the process is overseen by the math consultant in the state department of education. The consultant has two senior awardees who serve as facilitators; the respondent was one of the facilitators. The facilitators are responsible for getting the readers together and for most of the administration of the process. The facilitators do not serve as readers. This year, the respondent sent all nominees a personal letter in which she offered to help them with the paperwork. Three people did ask for help. In another state, an information meeting is held for the whole state before the application is due. One of the respondents currently conducts this session.

Nomination Process

Nominations were most frequently made by principals (43 percent of respondents); curriculum coordinators, supervisors, and department chairs (18 percent); and teachers and colleagues (17 percent). Others making nominations included students, the president of the state math association, a daughter who is also a teacher, and the state superintendent of schools. Four of the respondents said that they had asked someone else to nominate them; in three cases it was the principal. Some awardees were nominated by more than one person. Indeed, one had been nominated by 28 people. Thirteen percent of the respondents did not know who had nominated them. An additional 12 percent were unsure but mentioned who they thought had made the nomination. Three respondents had attended a Woodrow Wilson Foundation program and thought that all participants were nominated for the PAESMT. Most respondents thought that their experience was typical of the way people become nominated.

A few respondents had been pressured to apply. One was sent an application by the math supervisor, but she refused to fill it out because it was too lengthy. However, her principal insisted. Another respondent said,

> *The principal is an assertive person who likes to be involved in this kind of thing. The principal said, "Don't you want to do it for the money for the school?" It was more of a directive.*

One respondent was nominated as the result of a serendipitous event. He was supposed to meet someone for breakfast, but the person never showed up at the restaurant. The winner from the previous year, who also teaches in the same district, happened to be there and they started talking. The respondent described what he was doing in his classes and the previous awardee became most interested in his ideas and decided to nominate him.

Almost half (48 percent) of the respondents had been nominated before. Generally, they had been nominated once or twice before and had often been one of the three state finalists. Two respondents had been nominated five times

Major sources of nomination for awards	
Principals	43%
Curriculum coordinator, supervisors, department chairs	18%
Teachers and colleagues	18%

before. One science awardee had been nominated the year before in mathematics. Four respondents, each from a different state, said that in order to nominate someone or to be nominated you must have taught for either 3 or 5 years, depending on the state. (It should be noted that the guidelines call for 5 years of teaching.)

Awareness About the Program

Respondents' comments suggested that "awareness" may be somewhat of a problem and that lack of awareness may result in limited numbers of applications in some states or from some groups. A significant number of those addressing this issue (41 respondents) suggested that awareness was linked to membership in professional organizations or being "in the network" of science and math teachers.

> *The week in Washington made me feel proud of myself and through this I was able to motivate other teachers.*

The following comments are illustrative.

In 1990, when I got the award, I wasn't that aware of it. Awareness has grown since then. It's a small state and the number of awardees has grown. Teachers who are active in the state organizations are definitely aware. For the others, I would guess that awareness is low.

The crowds I hang out with are very active and very aware, but this is not a majority. In a department of 10 to 12 teachers, only 1 or 2 attend conferences. The award is mentioned in the newsletters of math professional groups but you have to belong to get the information and many are not members.

Awareness may have increased since 1990, both because of the wider coverage of the teaching force (the addition of elementary school teachers) and explicit efforts toward wider publicity.

Teachers are very aware now because of the statewide telecommunications network. The state also has a strong science teacher association, which has a weekend science camp attended by about 1,000 people each year. There is a reception for the winners as a part of the camp.

It used to be more of an "old boys network." The process has improved and the program is becoming more known throughout the state. More teachers are willing to participate now that the selection process is fairer.

Information is there if people take the time to read it. A state newsletter goes to every teacher in the state. The award is mentioned in the state professional organization newsletter and the state union literature. A spring conference is held on all awards. Nomination forms are sent to every district.

Some respondents commented that teachers are aware of the program, but many do not apply because of the difficult application. As one stated, "Probably 30 percent of those nominated never apply because the application packet burden is horrific." Suggestions for making the application process more user friendly are presented in the Suggestions for Strengthening the Program section of this report.

Publicity About the Award

Publicity received by awardees ranged from overwhelming to "no media coverage." For 77 percent of the awardees, the amount of publicity was moderate to substantial, particularly at the local level. The most common forms of publicity were newspaper articles, television and radio interviews, and articles in professional publications. Twenty-three percent of the respondents said they had received little coverage or not enough.

Some of the more unique stories regarding publicity are as follows:

- One awardee had a telephone interview with the Secretary of Education.
- One respondent wanted to "low key" the publicity. However, the teacher who nominated him called the newspaper. He was on the front page with a picture. In addition, this respondent has served as the chief negotiator for the teachers in his district for 14 years. Settlement came on the same day as the award, so a second article about him appeared on the front page. "It showed that you can be a strong union advocate and a strong teacher. I am most proud of this." He was also named citizen of the month and received other local recognition. The state union put an article in its monthly publication with a picture.
- One respondent was one of the awardees interviewed by CNN during the week in Washington. She also went up on Capitol Hill and spoke before the Education Committee. She was one of seven speakers--three math winners, three science winners, and Luther Williams, the director of NSF's Education and Human Resources Directorate.
- The local utility company publicizes the winners of both the state- and national-level awardees.
- One awardee was named state person of the week. A full page in the newspaper was written about her. Articles also appeared in the education association and district newsletters.
- One awardee received no state publicity -- "absolutely no TV, no radio, no newspaper had any news about the award." The announcement came on the same day as the teams involved in the greatest college football rivalry in the state played, "so that was the news and the rest was old the next day."
- The public relations person for the district made the publicity arrangements for one awardee. He was written up in three different newspapers. He also received a proclamation from the State House of Representatives.
- Mostly as the result of the PAESMT, one respondent was named a State Farm good neighbor in 1993. There was a magazine ad campaign in many national magazines (*Life, U.S. News & World Report,* etc.) with a picture of her and several of her students and a write up about her and her school.
- The annual state math conference was dedicated to one awardee. There was an awards ceremony and a square dance was named in her honor.

Suggestions for Strengthening the Program

Major Strengths and Weaknesses of the Program

When asked about strengths of the program, respondents expressed their happiness with the recognition given to them through the award, the excitement of the week in Washington, the networking, and the opportunities created from the financial aspect of the award. A strength mentioned by many was that PAESMT rewards

hard-working and creative teachers. For most, the week in Washington was one of the highlights of the program. One said the week was "totally impressive, wonderful, and organized." Another said,

> *The week in Washington made me feel proud of myself and through this I was able to motivate other teachers.*

Several commented that they were glad that elementary school teachers could now be awardees.

When asked about the weaknesses of the program, almost a fifth of respondents (18 percent) indicated the need for more publicity about the award. Many teachers also mentioned this in the context of increasing the participation of underrepresented groups.

We're a resource that doesn't get used enough.

Nineteen percent of respondents indicated the need for more followup after the award and the need to have a contact person at NSF to inform about their activities. Some had written reports of their activities after a year and a half and were wondering whether they should write a final report. They had no idea who to contact at NSF to ask questions or to share the exciting activities in which they had been involved. They seemed unaware that there was a program officer overseeing PAESMT or may have been confused because of the rotating nature of this position.

Also, almost a fourth (24 percent) of awardees noted the tremendous amount of time involved in completing the application. The application was described by some as "harrowing." Many suggested streamlining the application so that it did not require so much paperwork. Others discussed that the application due date should not be at the time that grades are due, but should be in the summer when teachers have more time. Although many respondents disliked the application, others said that they enjoyed completing it because it allowed them to evaluate where they had been and where they were going. Others said they realized that the lengthy and difficult application was necessary to make good selections.

Some suggested that the application process depended too much on how applicants "look on paper." Many suggested the need for classroom observations or videotapes in order to see the teacher in action.

Despite the increased amount of networking that has resulted from the award, some respondents, nonetheless, suggested the need for expanding opportunities for networking. Some discussed the need for more time in the networking sessions during the week in Washington. One wanted to have money set aside to send awardees to conventions so that they would be able to network. Another mentioned the need for a reunion of awardees to reestablish a national perspective on the award and discuss reform in education. Another wanted an alumni association of awardees. (This may be a case of the awardee being unaware of existing organizations or, perhaps, wanting an alumni organization that is somehow different in nature from those that already exist.)

Others said that NSF needs to draw more on the talent pool of PAESMT awardees. As one respondent put it, she loved being wined and dined in Washington, but while they were being wined and dined, their brains could have been picked more.

> *We're a resource that doesn't get used enough.*

Others mentioned the raffle in D.C. as an area of concern. Because awardees can go away with vastly different amounts of prizes, they suggested discontinuing the raffle and making gifts to teachers of equal value.

Other suggestions made by awardees were that they thought middle school teachers should not have to compete with secondary school teachers, that the awards should be scheduled as much as possible around the schedule of the President, that the award should be tax exempt, that the financial award be made directly to the teacher to control expenditures, that all applicants be notified about results, and that there be more focus on the state winners. As one respondent said,

They are winners too.

Suggestions for Increasing Participation

Most discussion in this area focused on increasing participation among underrepresented groups, such as minorities and the disabled. Many teachers who have been in the position to review PAESMT applications were concerned about the small numbers of minorities who apply. Others were aware of the problem in other states, but came from states where there were few minorities. Nevertheless, some had been active in nominating minorities themselves.

Teachers' suggestions for increasing participation among underrepresented groups mainly focused on having greater publicity, especially outside professional organizations, which may have low minority memberships. Almost a fourth (23 percent) indicated that the award should be more publicized. One suggested providing information about the award in magazines like *Newsweek*. Others suggested using television announcements and using PBS. Respondents also noted the need for administrators and teachers to know about the award, and some mentioned the need for the announcement of the award to be made in Spanish. Many mentioned that the announcement should be sent to every school with a note about encouraging minorities. Special emphasis should be put on inner city schools.

Other respondents mentioned the need for mentoring minorities and providing assistance with application materials. Several suggested that previous awardees should fulfill these roles. Winners who are members of minority groups may be especially encouraging to other minorities. One respondent suggested a 1-800 number be used for help with the application.

Ten percent of the respondents suggested that there be workshops for persons interested in the award. Workshops could be used to improve writing abilities and provide information about how to complete the application. Also, because several noted that some cultures value humility and have difficulty with self-promotion and asking for others to promote them, workshops could be used to address "blowing your own horn" and how to ask for letters of recommendation.

Finally, many respondents noted the need to get more members of underrepresented groups into teaching so that they could be nominated for the PAESMT. In many states, minorities have very low representation in math and science. Thus, more work needs to be done at the high school and college levels to encourage members of underrepresented groups to go into these areas of study.

Conclusion

The findings from our conversations with teachers recognized by PAESMT in 1990 and 1991 indicate that the program is one of significant merit. It provides recognition to individual teachers and the teaching profession, motivates the awardees themselves, and empowers those recognized to share their skills and resources with their colleagues and the community. The word heard over and over again was "validation," both individual and collective, for those who devoted themselves to teaching.

In presenting our findings we have tried to use the words of awardees themselves as much as possible because their comments to us, more than any statistical figures, provide a rich documentation of the impact that PAESMT has

had. Even with using the awardees' own words, however, it is not possible to convey the enthusiasm that permeated the conversations and the excitement that was reflected in the stories that were shared. PAESMT is a program with significant impact on the teachers recognized; the teachers recognized, in turn, have impacted their colleagues in some very significant ways. By recognizing 1,400 individuals, NSF has positively touched several times that number of teachers and learners.

I lighted another fire.

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